PATENT
Docket No.: 1021-001US01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Adam Thier	Technology Center: 3600
Serial No.: 09/575,599	Art Unit: 3623
Filed: May 22, 2000	Examiner: Andre D. Boyce
For: REVENUE FORECASTING AND SALES FORCE MANAGEMENT USING STATISTICAL ANALYSIS	

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APPEAL BRIEF

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Dear Sir:

This is an Appeal from the Final Rejection mailed September 24, 2003, and Advisory Action mailed December 8, 2004. The Notice of Appeal was filed on January 26, 2004. This Appeal Brief is being filed on or before the two-month due date of March 26, 2004. This Appeal Brief is being submitted in triplicate. Enclosed is a check for $330.00 to cover the fee for filing the Appeal Brief. Please charge any additional fees that may be required or credit any overpayment to Deposit Account No. 50-1778.

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REAL PARTY IN INTEREST

The real party in interest is Adaytum, Inc. of Bloomington, Minnesota.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1-42 and 44-51 are on appeal in this case.

Claims 1-3, 5-8, 10-13, 15, 16, 25-29, and 31-34 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Johnson et al. (US 6,067,525) (hereafter "Johnson").

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson, in view of Arbabi et al. (US 5,461,699) (hereafter "Arbabi").

Claims 9, 14, 17-24, 30 and 35-42 and 44-51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson in view of Lazarus et al. (US 6,430,539) (hereafter "Lazarus").

STATUS OF AMENDMENTS

The claims have not been amended under 37 C.F.R. § 1.116. The claims stand as amended in the Amendment filed under 37 C.F.R. § 1.111, mailed June 27, 2003.

SUMMARY OF INVENTION

Appellant's invention generally relates to techniques for statistically quantifying and mathematically modeling sales opportunities in order to forecast revenue and generate solution-oriented sales plans. As generally described in the patent application, a system for executing the techniques may include a database that stores a mathematical model as a plurality of related objects that represent of business opportunities and associated conditions. The conditions objectively represent activities performed by a sales organization and other facts that impact achieving the business opportunities. As described in the present application, the invention reduces the reliance on subjective input conventionally relied upon for revenue forecasting, and allows enterprises to objectively forecast revenue in a more accurate, quantifiable manner.

FIG. 1 illustrates one exemplary system 2 in which a sales organization 6 provides data and receives reports from revenue forecasting system 30. The sales organization 6, for example, may use communication devices 16 to send data and receive reports from revenue forecasting system 30 via network 18.[1] Condition set 34 takes the form of a database that defines a model that establishes relationships between business opportunities and "conditions" that are necessary to achieve the opportunity.[2] All pending claims require the use of a mathematical model in generating a probability of successfully achieving business opportunities, wherein the mathematical model has a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities.

As further described in the patent application, the database may store a first set of estimate probabilities received from a modeling engineer that represent preconceived probabilities for achieving the opportunities. For example, model builder 32 allows a user, referred to in the application as a model engineer, to graphically define a model for a given product or service. This typically involves researching historical sales data and identifying facts such as average sale size and sales per industry sector. The model engineer works with sales organization 6 and other executives to determine the business opportunities and conditions necessary to achieve the opportunities. Based on this input,

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[1] See generally Appellant's Application, page 3, line 23 to page 4, line 11.

the model engineer interacts with model builder 32 to define the mathematical model.[3] Notably, the modeling engineer objectively establishes this first set of estimate probabilities based on historical sales data and other facts.

Once the model is developed and objective, preconceived probabilities are established by the model engineer, input data is collected from the sales force. The statistical engine 36 analyzes the database and calculates a second set of probabilities as a function of: (1) the input data, and (2) the pre-established distribution represented by the first set of probabilities. This second set of probabilities represents a "posterior distribution" for the conditions and indicates the probability of successfully achieving the business opportunities.

For example, an embodiment is described in detail in which statistical engine 36 applies Bayes' Rule to obtain a "posterior distribution" for the conditions based on both the objective estimated distribution provided by the model engineer and the actual input data received from sales organization 6. From this posterior distribution, statistical engine 36 may further compute other predictive distributions for future observations.[4]

For example, given a set of data D received from sales organization 6 and a model M stored within condition set 34, the application describes a statistical expression as follows:

$$P(M \mid D) = P(M)\left[\frac{P(D \mid M)}{P(D)}\right],$$

where P(M) represents the mathematical model itself as stored within condition set 34, P(D|M) is the likelihood of the data D in light of the model M and represents the prior estimates and weighted averages provided by the model engineer. The denominator P (D) is a normalization term such that the relative probabilities generated for different models on the same data can be calculated. The ability to explore different probability levels, i.e., generate other predictive distributions, can be highly advantageous for the revenue forecaster, permitting analysis of different "what if" scenarios.[5]

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[2] Appellant's Application, page 4, lines 21-22.
[3] See Appellant's Application, page 5, line 29 to page 6, line 16.
[4] See Appellant's Application, page 6, lines 18-21.
[5] See Appellant's Application, page 6, lines 22-30.

As further described in the present application, the system further includes a marketing engine 42 that generates a sales plan as a function of the second set of probabilities, and a reporting engine generates a revenue report as a function of the second set of probabilities.[6]

In this manner, the invention utilizes a "two-stage" process for statistically quantifying and objectively forecasting revenue. This two-stage processes allows an enterprise to assign a first set of objective, estimate probabilities to conditions associated with a achieving a sales opportunity *a priori*. The second set of probabilities can then be calculated as a function of the subsequent input data collected from the sales force, and the pre-established distribution represented by the first set of probabilities. In this manner, the invention reduces the reliance on subjective input conventionally relied upon for revenue forecasting, yet allows large-scale enterprises to collect input from sales personnel in real-time and accurately forecast revenue.

Claims 17-24 are specifically directed to this two-stage revenue forecasting process. For example, claims 17-24 generally require storing a mathematical model in a database, wherein the model includes a plurality of objects representing business opportunities and associated conditions for achieving the business opportunities; storing a first set of probabilities received from a user representing estimated probabilities for achieving the opportunities; receiving input data from a sales organization indicating a status of at least one condition associated with one of the business opportunities; and calculating a second set of probabilities as a function of the input data, the mathematical model, and the first set of probabilities, wherein second set of probabilities indicate the probability of successfully achieving the business opportunities. Claims 35-37 and 49-51 recite similar features to those of claims 17-24.

Claims 1-16 are more broadly directed to a method of mathematically modeling business opportunities and generating probabilities of achieving the business opportunities.

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[6] See e.g., Appellant's Application, page 8, lines 12-21 and page 9 lines 21-24.

ISSUES

Appellant submits the following two issues on Appeal.

ISSUE 1: Whether claims 1-3, 5-8, 10-13, 15, 16, 25-29, and 31-34 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by Johnson et al. (US 6,067,525) (hereafter "Johnson").

ISSUE 2: Whether claims 17-24, 35-42 and 44-51 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Johnson, in view of Lazarus et al. (US 6,430,539) (hereafter "Lazarus").

GROUPING OF CLAIMS

Group 1: Claims 1-8, 10-13, 15, 16, 25-29, and 31-34

Group 2: Claims 9, 14, 17-24, 30, 35-42, 44- 51.

The Board should select claim 1 for consideration of Group 1. In order to simplify the issues on Appeal, Appellant submits that claims 1-7, 11-13, 15, 16, 25-28, and 31-34 stand or fall together. However, dependent claims 8, 10, and 29 of Group 1 do not stand or fall together with claim 1, and are separately patentable from claim 1.

The Board should select claim 17 for consideration of Group 2. In order to simplify the issues on Appeal, Appellant submits that claims 9, 14, 17-24, 30, 35-42, 44-48 stand or fall together. However, dependent claims 49 and 50 of Group 2 do not stand or fall with claim 17, and are separately patentable from claim 17.

ARGUMENTS

In the final Office Action, the Examiner rejected Appellant's claims under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a) based on Johnson, Arbabi and Lazarus. However, the applied references, either alone or in combination, fail to disclose or suggest the features defined by Appellant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention. Therefore, Appellant respectfully requests that all rejections be reversed. Appellant addresses each of the references and the specific rejections in greater detail below.

The Johnson reference

The Johnson reference is the primary reference cited by the Examiner for all rejections. Johnson describes a salesforce automation system which integrates computerized, intelligent automated salesperson support for multiple phases of the sales process. In particular, Johnson describes various subsystems which can aid the sales process by generating leads, maximizing time spent with the customer, managing orders, ensuring customer satisfaction, and so forth.

Johnson does include a few passages which bear a tangential relation to the features recited in Appellant's claims. For example, Johnson describes an "objective management module" by which a sales process may be assigned to a sales objective. opportunity.[7] According to Johnson, states that "the system may automatically calculate the probability of closing the sale with the date and value of each opportunity and process and consider both the sales status and the customer's buying status."[8] Johnson states briefly that a data and formula matrix is used to calculate the probability of closing sales opportunities.[9] Johnson provides no details whatsoever regarding the data stored within the data and information matrix, and provides no details as to how the matrix is used to calculate the probability of closing sales opportunities.

Finally, Johnson briefly mentions the use of a forecasting module to provide functional and product forecast information to the salesperson related to sales, revenue,

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[7] Johnson, column 21, lines 1-3.
[8] Johnson, column 21, lines 20-23.
[9] Johnson, column 26, lines 30-39.

commission and profit.[10] Johnson states that the forecasting module utilizes data for closed sales, data for opportunities with a stated prediction of close, or data for a combination of both as received from other components of the system to generate the forecast reports. Johnson provides no further details regarding forecasting enterprise revenue.

The Lazarus reference

Lazarus is generally directed to the modeling of "consumer financial behavior" (i.e., the modeling of consumer spending habits on goods and services), and is unrelated to the system and techniques for forecasting enterprise revenue described and claimed by the Appellant. In particular, Lazarus describes techniques for modeling consumer financial behavior by application of consumer transaction data to predictive models associated with merchant segments.

In general, Lazarus describes a predictive model generation system that models consumer spending at different merchants. The predictive model generation system seeks to identify patterns of consumer spending that results in the "co-occurrence" of similar transactions at different merchants. Based on these identified spending patterns, the predictive model generation system predicts consumer financial behavior.[11]

In the passages relied upon by the Examiner, Lazarus describes an algorithm for determining whether two merchants are related by estimating "expected co-occurrence counts." In particular, the passage relied upon in Lazarus merely teaches computing the co-occurrence events (i.e., the number of consumer spending transactions at similar merchants), by computing a binomial distribution.

Consequently, Lazarus is unrelated to forecasting enterprise revenue, and does not describe any modeling techniques similar to Appellant's claimed techniques. As one example, and as set forth in detail below, the binomial distribution techniques described in Lazurs for computing merchant co-occurrence events is entirely unrelated to Appellant's two-stage process for statistically quantifying and objectively forecasting revenue. Lazarus makes no mention of a processes that allows an enterprise to assign a

[10] Johnson, column 21, lines 30-39.

first set of objective, estimate probabilities to conditions associated with a achieving a sales opportunity *a priori*, i.e., before input data is collected. Lazarus makes no mention of the calculation of a second set of probabilities as a function of the subsequent input data collected from the sales force, and the pre-established distribution represented by the first set of probabilities.

The Arbabi reference

Arbabi is directed to general forecasting techniques that may be applied, for example, to forecast future employment or census data. Arbabi describes a forecasting system that combines a neural network with a statistical forecast. A "neural network" refers to a network of interconnected neurons.[12] Artificial or computer neural networks are computer simulations of such neurons.[13] A biological example of a neural network is the human brain.[14]

The Arbabi reference appears to bear little or no relation to Appellant's pending claims. The Examiner has cited Arbabi as disclosing the use of a personal digital assistant (PDA) to send input data used in statistical forecasting. The passage cited by the Examiner, however, mentions a PDA for use in executing neural network software, and not for sending input data to another device as suggested by the Examiner.

Neither Arbabi, Lazarus nor Johnson teach or suggest Appellant's claimed invention, either alone or in combination with one another.

Arguments with respect to Issue 1

In the Final Office Action, the Examiner rejected claims 1-3, 5-8, 10-13, 15, 16, 25-29, and 31-34 under 35 U.S.C. § 102(e) as being anticipated by Johnson. Appellant respectfully requests reversal of these rejections. Johnson fails to disclose each and every feature of the claimed invention, as required by 35 U.S.C. § 102, and provides no teaching that would have suggested the desirability of modification to include such features.

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[11] Column 3, lines 10-54.
[12] Arbabi, column 5, lines 34-42.
[13] Id.
[14] Id.

In order to support an anticipation rejection under 35 U.S.C. § 102(e), it is well established that a prior art reference must disclose each and every element of a claim. This well known rule of law is commonly referred to as the "all-elements rule."[15] If a prior art reference fails to disclose any element of a claim, then rejection under 35 U.S.C. § 102(e) is improper.[16]

All of Appellant's pending claims (including claims 1-8, 10-13, 15, 16, 25-29, and 31-34 of Group 1) generally require the use of a mathematical model in generating a probability of successfully achieving business opportunities, wherein the mathematical model has a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities.

For example, Appellant's claim 1 recites:

> *A method comprising:*
>
> *storing in a database data defining a mathematical model having a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities;*
>
> *receiving input data from a plurality of users, wherein the input data indicates a status of at least one of the conditions associated with one of the business opportunities; and*
>
> *generating a probability set indicating the probability of successfully achieving the business opportunities as a function of the input data and the mathematical model.*

Claim 1: storing a mathematical model

In rejecting Appellant's claim 1, the Examiner asserts that Johnson discloses storing in a database a mathematical model having a plurality of related objects that represent business opportunities and conditions associated with achieving the business

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[15] *See Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81 (CAFC 1986) ("it is axiomatic that for prior art to anticipate under 102 it has to meet every element of the claimed invention").

[16] *Id. See also Lewmar Marine, Inc. v. Barient, Inc.* 827 F.2d 744, 3 USPQ2d 1766 (CAFC 1987); *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (CAFC 1990); *C.R. Bard, Inc. v. MP Systems, Inc.*, 157 F.3d 1340, 48 USPQ2d 1225 (CAFC 1998); *Oney v. Ratliff*, 182 F.3d 893, 51 USPQ2d 1697 (CAFC 1999); *Apple Computer, Inc. v. Articulate Systems, Inc.*, 234 F.3d 14, 57 USPQ2d 1057 (CAFC 2000).

opportunities.[17] In forming this conclusion, the Examiner asserted that Johnson that describes an opportunity management module that utilizes a data and formula matrix used to calculate probability of closing a sales opportunities.[18] The Examiner then asserted that:

> *[A]n automatic calculation [of the probability of closing a sale] MUST inherently include a mathematical model. In other words, an automatic calculation CANNOT exist with (sic) an associated mathematical model. (emphasis original.)*[19]

This reasoning fails for several to reasons.

First, as described above, Johnson provides no details whatsoever regarding the data stored within the "data and formula matrix," and provides no details as to how opportunity management module utilizes the matrix to automatically calculate the probability of closing sales opportunities. Consequently, the "data and formula matrix" described by Johnson and relied upon by the Examiner in no way represents a mathematical model of a set of the business opportunities and associated conditions for achieving the business opportunities from which a revenue forecast can be statistically generated. To the contrary, there is no indication that the contents of the matrix are organized as or otherwise define business opportunities and associated conditions for achieving these opportunities.

One example of the Examiner's misconstruction of the data and formula matrix of Johnson is the conclusory statement that "[i]nterconnected relationships are set up via the data and formula matrix in order to calculate the probabilities of closing a sale."[20] For support for this assertion, the Examiner refers to FIG. 10B. However, FIG. 10B is not related to the data and formula matrix. Moreover, FIG. 10B merely shows a database architecture of the system, and makes no mention of a *mathematical model*, in which the objects of the mathematical model comprise a set of business opportunity objects that are each interconnected by defined relationships with a set of corresponding condition objects. Consequently, the Examiner's assertion is incorrect and not supported by

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[17] See Final Office Action, page 3.
[18] See Final Office Action, page 3.
[19] Advisory Action, pg 2.

substantial evidence, as is required. Johnson provides absolutely no details whatsoever as to the contents, construction or application of this "data and formula matrix," let alone describing the statistical modeling technique as claimed by the Applicant.

Second, there is a fundamental difference between a "mathematical model" and a matrix. According to the Encyclopedia Britannica the meaning of "mathematical model" is "a mathematical representation of reality."[21] With respect to the present application, the mathematical model recited by Appellant's claims therefore *mathematically represents* the business opportunities and the conditions for achieving these opportunities. As described in detail within the present application, it is this mathematical representation that allows the enterprise revenue to be statistically forecasted in an objective manner with respect to the business opportunities.

In contrast, the meaning of "matrix" is defined by the Encyclopedia Britannica as "a set of numbers arranged in rows and columns so as to form a rectangular array." There is no teaching or suggestion in Johnson that the data and formula matrix relied upon by the Examiner even relates to business opportunities and conditions for achieving the opportunities, let alone *mathematically representing* the relationships between the conditions and the opportunities. Consequently, Johnson fails to teach or suggest storing in a database a mathematical model having a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities, as recited by Appellant's claims.

Claim 1: generating a probability set

In addition to these deficiencies, Johnson does not describe generating a probability set as a function of input data from a sales force and the mathematical model, wherein the probability set indicates the probabilities of achieving the business opportunities, as further recited in claim 1. In other words, assuming for the sake of argument that the data and formula matrix could be construed as some sort of mathematical model having a plurality of related objects that represent business

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[20] See, Final Office Action, pg. 4.
[21] www.britanica.com.

opportunities and conditions associated with achieving the business opportunities, there is no teaching or suggesting of using the mathematical model, as well as input data from a sale force, to further compute probabilities for achieving the business opportunities.

With respect to this requirement of Appellant's claim 1, the Examiner relies on the same passages of Johnson that merely state the data and formula matrix is used to calculate the probability of closing a sale. However, Johnson provides no enabling disclosure as to how a set of probabilities could be calculated based on a mathematical model, much less a mathematical model having a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities, as required by Appellant's claims.

In short, Johnson provides nothing more than vague mention of the calculation of probabilities of closing sales, with no explanation of how Johnson calculates these probabilities. The Examiner has identified a passage of Johnson, as disclosing the use of a "matrix," to calculate probabilities of closing sales, but the content of this matrix is not explained in Johnson. None of the passages of Johnson cited by the Examiner discloses or suggests a mathematical model having a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities as required by Appellant's claims.

For these reasons, the Examiner has failed to establish a prima facie case for anticipation of Appellant's claims 1-3, 5-8, 10-13, 15, 16, 25-29, and 31-34 under 35 U.S.C. § 102(e). Reversal of the rejections is respectfully requested.

Claim 10

The Examiner's analysis is further obfuscated with respect to the analysis of claim 10 of Group 1, which is separately patentable from claim 1. Appellant's claim 10 recites the distinct step of adaptively adjusting the model in response to the input received from the users. In rejecting claim 10, the Examiner refers to column 33, lines 44-47, which indicate that an expert system may "dynamically alter the rules in the event manager

database to automatically initiate ... the identified events or actions similar subsequent sales activities."[22]

This passage of Johnson, however, refers to control of a sales process in an automated manner. In other words, this passage of Johnson does not even refer to the data and formula matrix relied upon by the Examiner in rejecting claim 1. Moreover, this passage of Johnson is entirely unrelated to updating a mathematical model used for generating probability sets for forecasting revenue.

In column 35, Johnson discusses the use of a knowledge base to dynamically update the probability of sale in response to an event. Updating the probability based on events, however, is fundamentally different than updating the model itself, which controls how the probabilities are calculated. Appellant respectfully requests reversal of the rejection of claim 10 under 35 U.S.C. § 102(e).

Claims 8, 29

Claims 8 and 29 of Group 1 are separately patentable from claim 1, and recite the distinct step of generating the probability set by analyzing the mathematical model with a statistical engine. In rejecting claims 8 and 29, the Examiner relies on column 34, lines 20-40 of Johnson that describes an inference engine for making automated intelligent decisions regarding which steps of sales process should be performed.

Applicant respectfully points out that a rule-based inference engine is entirely different from a statistical engine that generates probabilities from a mathematical model. Moreover, the inference engine described in column 34 of Lazarus has nothing to do with the data and formula matrix, which the Examiner has construed as a mathematical model. In other words, even if the inference engine could be somehow be construed as a statistical engine, Johnson does not teach or suggest the inference engine operating on the data and formula matrix. As a result, Johnson clearly fails to teach or suggest a statistical engine that analyzes a mathematical model of business opportunities and conditions to generate a probability set. The Appellant respectfully requests reversal of the rejection of claims 8 and 29 under 35 U.S.C. § 102(e).

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[22] See Final Office Action, page 4.

Arguments with respect to Issue 2

In the Final Office Action, the Examiner rejected claims 9, 14, 17-24, 30 and 35-42 and 44-51 under 35 U.S.C. § 103(a) as being unpatentable over Johnson in view of Lazarus. Appellant respectfully requests reversal of these rejections.

In order to establish a prima facie case of obviousness, three basic criteria must be met. First, the prior art reference or references when combined must teach or suggest each and every claim limitation. Second there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Finally, there must be a reasonable expectation of success.[23] The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. As outlined below, the reasoning set forth by the Examiner fails these well-established criteria.

The arguments outlined above with respect to Issue 1 also apply to Issue 2. In particular, the rejections under 35 U.S.C. § 103(a) should be reversed insofar as Johnson fails to disclose or suggest use of a mathematical model in generating a probability of successfully achieving business opportunities, wherein the mathematical model has a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities. In addition, as outlined in greater detail below, claims 17-24, 35-42 and 43-51 include additional features which are not disclosed or suggested in either Johnson or Lazarus.

The Examiner asserts that Appellant's claims 17-24, 35-42 and 43-51 would have been obvious to one skilled in the art over Johnson in view of Lazarus. However, as set forth in detail below, the Examiner proposes to modify the Johnson system to incorporate features that are not even taught or suggested by Lazarus or any other prior art of record. Thus, the conclusion of obviousness advanced by the Examiner is not based on substantial evidence of the record and should be reversed.

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[23] See MPEP 706.02(j) quoting In re Vaick, 947 F2d 488, 20 USPQ2d 1438 (Fed Cir. 1991).

Claim 17

Appellant's claim 17 recites:

> *A method comprising:*
>
> *storing a mathematical model in a database, wherein the model includes a plurality of objects representing business opportunities and associated conditions for achieving the business opportunities;*
>
> *storing a first set of probabilities received from a user representing estimated probabilities for achieving the opportunities;*
>
> *receiving input data from a sales organization indicating a status of at least one condition associated with one of the business opportunities; and*
>
> *calculating a second set of probabilities as a function of the input data, the mathematical model, and the first set of probabilities, wherein second set of probabilities indicate the probability of successfully achieving the business opportunities.*

In rejecting claim 17, the Examiner cites column 23, lines 18-35, and asserts that Lazarus generally discloses calculating a second probability as a function of a plurality of probabilities, based upon specific input data to calculate the probability of success.[24] Based on this, the Examiner asserts that it would have been obvious to one skilled in the art to modify the Johnson system to achieve Appellant's invention as recited in claim 17.[25] This assertion fails for a number of reasons.

First, the Examiner is construing Johnson in a manner that is inconsistent with his previous assertions with respect to his anticipation rejection under section 102. Specifically, with respect to claim 17, the Examiner asserts that Johnson teaches the claim element of "storing a first set of probabilities *received from a user* representing estimated probabilities for achieving the opportunities," (emphasis added). However, for support of this assertion, the Examiner refers to the exact same sections of Johnson previously relied upon with respect to claim 1 for the assertion that the Johnson system

[24] See Final Office Action, pages 6-7.

itself *generates* a probability set based on a mathematical model.[26] In particular, the Examiner again refers to the data and formula matrix described by Johnson. As these assertions contradict each other, clearly at least one of these assertions in incorrect. In actuality, Johnson does not teach or suggest either of these elements.

Second, the Examiner's interpretation of Lazarus is incorrect. The passage of Lazarus cited by the Examiner does not disclose calculating a second set of probabilities for each of the business opportunities as a function of the input data, the mathematical model, and the first set of probabilities, wherein each of the second sets of probabilities indicates the probabilities of achieving the respective conditions associated with the corresponding business opportunity, as recited by claim 17. In fact, the cited passage does nothing more than express a probability distribution for a set of joint probability estimates. Expressing a set of probabilities as a polynomial, as described by Lazarus, does not teach or suggest calculating a second set of probabilities based on (1) a mathematical model of business opportunities and associated conditions, (2) a first set of probabilities received from a user and representing estimate probabilities for achieving the opportunities, and (3) input data indicating a status of a least one condition associated with achieving the business opportunities, as required by claim 17. Consequently, Lazarus does not describe Appellant's claimed "two-stage" process for statistically quantifying and objectively forecasting revenue.

More specifically, in the passages relied upon by the Examiner, Lazarus describes an algorithm for determining whether two merchants are related by estimating "expected co-occurrence counts." In particular, the passage relied upon in Lazarus merely teaches computing the co-occurrence events (i.e., the number of consumer spending transactions at similar merchants), by computing a binomial distribution. Lazarus is unrelated to forecasting enterprise revenue, and does not describe any modeling techniques similar to Appellant's claimed techniques.

Consequently, neither Lazarus or Johnson describe Appellant's claimed invention for forecasting revenue using statistical analysis of a mathematical model in which the

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[25] See Final Office Action, pages 6-7.

[26] Compare Final Office Action, pages 6-7 with Final Office Action, page 3.

mathematical model has a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities.

Similarly, neither of the references describe receiving a set of estimated probabilities for the conditions of the model from the model engineer, receiving input data from a sales organization indicating current statuses for the conditions, applying the model to compute a second set of probabilities for the conditions based on both the estimated probabilities provided the user and the current statuses for the conditions.

Appellant respectfully requests reversal of the rejection of claims 17-24, 35-37 and 49-51 for the reasons outlined above.

Claim 49

Claim 49 of group II is separately patentable from claim 17 and recites the distinct steps of receiving a set of estimated probabilities for the conditions of the model from the model engineer, receiving input data from a sales organization indicating current statuses for the conditions, applying the model to compute a posterior distribution for the conditions based on both the estimated probabilities provided by the model engineer and the current statuses for the conditions, and generating a revenue forecast for the business opportunities based on the computed posterior distribution.

For the reasons set forth above, neither of the references teach or suggest the Appellant's two-stage process for statistically forecasting revenue and generating a revenue forecast. as specifically recited in claim 49. Appellant respectfully requests reversal of the rejection of claim 49 under 35 U.S.C. § 103 for the additional reasons outlined above.

Claim 50

Claim 50 of group II is separately patentable from claim 17, and recites the distinct step of:

applying the model by computing:

$$P(M \mid D) = P(M)\left[\frac{P(D \mid M)}{P(D)}\right],$$

where data D represents the current statuses for the conditions, P(M|D) represents the posterior distribution, P(M) represents the model, and P(D|M) is the likelihood of the data D in light of the model M and represents estimate probabilities.

With regard to claim 50, the Examiner simply took "official notice" that conditional probability is old and well known theory of statistics.[27]

Thus, the Examiner failed to offer any evidence in support of this conclusion, and has offered nothing to suggest that a person with ordinary skill in the art would have been motivated to the apply the techniques in the manner recited in claim 50, particularly in the context of the other features addressed above and recited in independent claim 49.

For example, the Examiner has offered no evidence of record that teaches or suggests the use of the subject matter of claim 50 to Appellant's claim system that applies a two-stage process for objectively generating a revenue forecast based a first set of estimate probabilities and a second set of probabilities representing a computed posterior distribution.

In addition, the Examiner's "official notice" fails to provide any evidence of a teaching or suggestion as to how such techniques could be applied to the Johnson system and, more specifically, to the data and formula matrix of the Johnson system to statistically forecast revenue based on a first set of estimate probabilities, input data from the sales force, and a second set of probabilities representing a posterior distribution, as required by claim 50. Appellant respectfully requests reversal of the rejection of claim 50 under 35 U.S.C. § 103 for the additional reasons outlined above.

CONCLUSION

The Examiner has failed to meet the burden of establishing a prima facie case of anticipation with respect to claims 1-3, 5-8, 10-13, 15, 16, 25-29, and 31-34 under 35 U.S.C. § 102(e). In addition, the Examiner has failed to meet the burden of establishing a prima facie case of obviousness with respect to claims 4, 9, 14, 17-24, 30, 35-42 and

[27] See Final Office Action, pg. 10.

44-51 under 35 U.S.C. § 103. In view of Appellant's arguments, the final rejection of claims 1-42 and 44-51 is improper and should be reversed.

Respectfully submitted,

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APPENDIX: CLAIMS ON APPEAL

1. A method comprising:

storing in a database data defining a mathematical model having a plurality of related objects that represent business opportunities and conditions associated with achieving the business opportunities;

receiving input data from a plurality of users, wherein the input data indicates a status of at least one of the conditions associated with one of the business opportunities; and

generating a probability set indicating the probability of successfully achieving the business opportunities as a function of the input data and the mathematical model.

2. The method of claim 1, wherein receiving data includes receiving data from a sales organization via a packet-based network.

3. The method of claim 2, wherein the packet-based network is the Internet.

4. The method of claim 1, wherein receiving input data includes receiving input data from a personal digital assistant (PDA).

5. The method of claim 1, wherein receiving input data includes receiving input data from a web browser accessing a web server.

6. The method of claim 1 and further including accessing a sales force automation program to extract a list of customers and corresponding contacts.

7. The method of claim 1, wherein the objects of the mathematical model comprise a set of business opportunity objects that are each interconnected by defined relationships with a set of corresponding condition objects.

8. The method of claim 1, wherein generating the probability set includes analyzing the mathematical model with a statistical engine.

9. The method of claim 1, wherein the mathematical model is a Bayesian model, and further wherein generating the probability set includes applying Bayesian statistical analysis to generate the probability set.

10. The method of claim 1 and further including adaptively adjusting the model in response to the input received from the users.

11. The method of claim 1 and further including generating a sales plan that prioritizes the business opportunities as a function of the probability set.

12. The method of claim 1 and further including generating an estimated revenue report as a function of the probability set.

13. The method of claim 1, wherein a subset of the conditions represents activities performed by a sales organization.

14. The method of claim 1, wherein a subset of the conditions characterize a technology infrastructure of a target customer of the business opportunity.

15. The method of claim 1, wherein each business opportunity is a sales opportunity having a target customer.

16. The method of claim 1, wherein the conditions include one or more of the following:

a salesperson,

a rate of success for the salesperson,

an average deal size for the salesperson,

a target customer,

an SIC code of the target customer,

revenue of the target customer,

profit of the target customer,

primary business sectors of the target customer,

technical infrastructure of the target customer,

decision makers of the target customer,

a product or a service of the target customer that would be displaced by achievement of the business opportunity,

one or more competitors of the target customer,

one or more vendors competing for the business opportunity,

competing products and services offered by the vendors,

a respective market share of the products or services offered by the vendors, and

a status for one or more activities including delivery of marketing information to the target customer, providing a technical overview of the product to the target customer, providing a demonstration to the target customer and providing an evaluation version to the target customer.

17. A method comprising:

storing a mathematical model in a database, wherein the model includes a plurality of objects representing business opportunities and associated conditions for achieving the business opportunities;

storing a first set of probabilities received from a user representing estimated probabilities for achieving the opportunities;

receiving input data from a sales organization indicating a status of at least one condition associated with one of the business opportunities; and

calculating a second set of probabilities as a function of the input data, the mathematical model, and the first set of probabilities, wherein second set of probabilities indicate the probability of successfully achieving the business opportunities.

18. The method of claim 17, wherein calculating the second set of probabilities includes applying Bayesian statistical analysis.

19. The method of claim 17 and further including adaptively adjusting the first set of probabilities in response to either the input received from the users or the second set of probabilities.

20. The method of claim 17, wherein receiving input data includes receiving input data from a web browser accessing a web server over the Internet.

21. The method of claim 17 and further including accessing a sales force automation program to extract a list of customers and corresponding contacts.

22. The method of claim 17 and further including generating a sales plan as a function of the second set of probabilities.

23. The method of claim 17 and further including generating a revenue report as a function of the second set of probabilities.

24. The method of claim 17, wherein a subset of the conditions represents activities performed by a sales organization.

25. A computer-readable medium having instructions contained therein to cause a programmable processor to:

store business opportunities and associated conditions in a database;

receive input data from a plurality of users, wherein the input data indicates a status of at least one condition associated with one of the business opportunities; and

generate a probability set indicating the probability of successfully achieving the business opportunities.

26. The computer-readable medium of claim 25, wherein receiving input data includes receiving data from a sales organization over a network.

27. The computer-readable medium of claim 25 and further including accessing a sales force automation program to extract a list of customers and corresponding contacts.

28. The computer-readable medium of claim 25, wherein the database represents a mathematical model, wherein each condition is associated with an object within the model.

29. The computer-readable medium of claim 28, wherein generating the probability set includes analyzing the mathematical model with a statistical engine.

30. The computer-readable medium of claim 28, wherein the mathematical model is a Bayesian model, and further wherein generating the probability set includes applying Bayesian statistical analysis to generate the probability set.

31. The computer-readable medium of claim 25 and further including generating a sales plan as a function of the probability set.

32. The computer-readable medium of claim 25 and further including generating a revenue report as a function of the probability set.

33. The computer-readable medium of claim 25, wherein a subset of the conditions represents activities performed by a sales organization.

34. The computer-readable medium of claim 25, wherein a subset of the conditions characterize a technology infrastructure of a target customer of the business opportunity.

35. A computer-readable medium having data structures contained therein comprising:

a first data field to store a business opportunity;

a first plurality of data field to store conditions related to the business opportunities, wherein a subset of the conditions represents activities performed by a sales organization;

a second plurality of data fields to store status of the conditions;

a third plurality of data fields to store a first set of probabilities received from a user; and

a fourth plurality of data fields to store a second set of probabilities indicating the probability of successfully achieving each business opportunities.

36. The computer-readable medium of claim 35, wherein the second set of probabilities is calculated as a function of the input data and the first set of probabilities.

37. The computer-readable medium of claim 35, wherein a subset of the conditions correspond to activities for achieving the business opportunity.

38. A system comprising

a database that stores data defining a mathematical model having a plurality of related objects that represents business opportunities and conditions associated with achieving the business opportunities; and

a statistical engine executing within an operating environment of a computer to analyze the mathematical model and calculate a first set of probabilities representing the probability of successfully achieving the business opportunities based on input data that defines a current status for each of the conditions.

39. The system of claim 38, wherein the database stores a second set of probabilities received from a user.

40. The system of claim 39, wherein the statistical engine applies Bayesian statistical techniques to calculate the first set of probabilities as a function of the input data and the second set of probabilities.

41. The system of claim 38, further comprising a network interface to communicate the input data from a plurality of users to the database.

42. The system of claim 38, and further including a sales force automation program (SAP) to maintain customer and contact information.

43. *Cancelled*

44. The system of claim 38, wherein a subset of the conditions represents activities performed by a sales organization.

45. The system of claim 38, wherein the statistical engine adaptively adjusts the model in response to the input data.

46. The system of claim 38, and further including a marketing engine to generate sales plan as a function of the first probability set, wherein the sales plan includes a list of activities associated with achieving the business opportunities.

47. The system of claim 38, and further including a reporting engine to generate a revenue report as a function of the first probability set.

48. The system of claim 38 and further including a model builder to receive a second set of probabilities from a user and store the second set of probabilities within the database.

49. A method comprising:

receiving input from a model engineer defining a model having a plurality of objects interconnected by defined relationships, wherein the objects represent business opportunities and conditions associated with achieving the opportunities;

receiving a set of estimated probabilities for the conditions of the model from the model engineer;

receiving input data from a sales organization indicating current statuses for the conditions;

applying the model to compute a posterior distribution for the conditions based on both the estimated probabilities provided by the model engineer and the current statuses for the conditions, wherein second set of probabilities indicate the probability of successfully achieving the business opportunities; and

generating a revenue forecast for the business opportunities based on the computed posterior distribution.

50. The method of claim 49, wherein applying the model comprises computing:

$$P(M \mid D) = P(M)\left[\frac{P(D \mid M)}{P(D)}\right],$$

where data D represents the current statuses for the conditions, P(M|D) represents the posterior distribution, P(M) represents the model, and P(D|M) is the likelihood of the data D in light of the model M and represents estimate probabilities.

51. The method of claim 49, wherein receiving input from a model engineer defining a model comprises presenting a user interface with which the model engineer interacts to graphically define the model including the objects and interconnecting relationships representing the business opportunities and conditions associated with achieving the business opportunities.